

### REMARKS

Claims 12, 14, 16-17, 19-27 are pending. Claims 13, 15 and 18 are cancelled herein. Claims 23-27 are new claims added herein.

#### I. Support for the claim amendments and new claims (23-27).

No new matter has been added.

Amended claim 12 is based on pending claims 12, 13, 15, and 18. Additional support as well is found in the description on page 6, lines 5 to 8 of the English text of the application as filed (not the substitute specification).

Independent device claim 14 is based on pending claims 14, 15, and 18. Additional support as well is found on the description at page 5, lines 8 to 10.

Independent device claim 23 is based on pending claims 14 to 18. Additional support as well is found in the description on page 5, lines 8 to 10.

Dependent claims 16, 17, and 19 to 22 are based on pending claims 16, 17, and 19 to 22. Further, dependent claims 24 to 27 are based on pending claims 19 to 22.

Pending claims 13, 15 and 18 are cancelled since the features of these claims are included in claims 12 and 14.

#### II. The specification has been amended to include the appropriate headings.

#### III. The 112 rejections.

The following minor amendments have been made for the reasons of improving more matters of form and do not trigger estoppel.

The term "rimless" has been deleted from the claims.

The term "exposed" by has been replaced by uncovered in the claims.

The terms "a mirror layer" have been deleted in claim 14.

In claim 16, the issues have been addressed. Support for the amendments are found in claim 16 as originally filed and at least in Figure 2.

Therefore, the 112 rejections are respectfully asserted to be traversed.

IV. The obviousness rejection of independent claims 12 and 14 in view of Farmiga cited from applicants' IDS. (Claim 15 is cancelled).

Claims 12 and 14 have been amended. Claim 12 is a combination so that  $12 = 12 + 13 + 15 + 18$ . Claim 14 is a combination so that  $14 = 14 + 15 + 18$ . Therefore as claims 13 and 18 were only rejected over a combination of Farmiga and Takahashi, the above rejection based Farmiga alone is traversed by the logic of the Office Action, and further discussion of the Farmiga and Takahashi combination rejection is made below.

V. The obviousness rejection of claims 13 and 18 in view of the combination of Farmiga and Takahashi the limitations of which are now part of claims 12 and 14 respectively.

Farmiga (US 5,828,505) discloses a method for producing a light integrator as well as a light integrator.

However, Farmiga does not disclose that any of the mirrored slabs are engaged with projection and cutout as claimed in claims 12 and 14, and also does not teach that this feature leads to a reproducible assembly which is inherent to the structure of claims 12 and 14 and also is stated goal of the present invention.

Further, Farmiga does not disclose the use of shrink tubing and especially does not disclose the combination of the shrink tubing and the engagement of the two parts by projection and cutout. Therefore, Farmiga does not disclose at least the following features of claim 12:

wherein the two parts are fabricated such that one of the two parts is provided with a projection for engaging in a cutout of the other part after assembly,  
covering the assembled parts with shrink tubing, and;  
shrinking the tubing until a suitable strength of the integrator is achieved for reducing a possible gap between said two parts in which light could be lost.

and in regard to claim 14:

wherein one part is provided with a projection engaging in a cut out  
of the other part after assembly; and  
wherein the parts are held together by at least one piece of shrink

tubing such that the parts contact one another to be practically light-proof.

The combination of the feature of the two parts (one part having the projection engaging in the cutout of the other part after assembly) and the feature of pressing the parts very close together by means of the shrink tubing leads to the advantage of a reproducible assembly as well as to the advantage that the parts can contact one another so as to be practically light-proof (as claimed) (that means, a possible gap between the two parts is reduced).

In addition, there is no hint in Farmiga that the above-mentioned features of claim 12 lead to a light integrator in which the parts can contact one another so as to be practically light-proof.

The USPTO notes these deficiencies to obviate the claim 13 and the claim 18 limitations in citing Takashi (remembering currently 12= 12+13+15+18 and 14= 14+15+18).

However, it is respectfully asserted that Takahashi does not make up for the deficiencies in teachings of Farmiga to teach the limitations from claims 13 and 18 as is required for a combination of references to establish a prima facie case of obviousness under MPEP 706.02(j) as is required for a proper obviousness rejection (MPEP cites 35 USC 103) for the following reasons.

Takahashi (US 5,755,793) shows a joint between a pipe 132 and a flexible tube 132 (Fig. 8, column 14, lines 37 to 48). The flexible tube 132 is slipped over the pipe 132 and the outer surface of the flexible tube 100 at the junction of the flexible tube 100 and the pipe 132 is covered directly with a heat shrinking tube 300 so that the flexible tube 100 is forcedly depressed onto the pipe 132.

Therefore, Takahashi teaches that for a connection between a flexible part and a rigid part a shrinking tube can be used to forcedly depress the flexible part onto the rigid part.

If, however, the tube is not flexible, then the depressing for fastening will not be possible and therefore the shrinking tube cannot be used. Applicants respectfully note that in claims 12 and 14, the parts having the reflective coating are at least logically and inherently claimed structurally to be not flexible and are not slipped over another part like the tube and the pipe in Takahashi. Therefore, Takahashi is non-analogous art which would have to be impermissibly totally redesigned, and which following the USPTO's proposed

combination would result in a proposed modification which is impermissible in that under MPEP 2143.01 (see page 2100-125) the proposed modification cannot change the principle of operation of a reference and thus the teachings of the reference are not sufficient to make up for the deficiencies of Farmiga as asserted by the USPTO and thus to render the claims *prima facie* obvious (citing *In Re Ratti*). Additional technical reasons for the above legal reasoning are also provide below.

Further, a shrink tubing cannot be used as an alternative fastening used means to fasten the mirrored slabs of Farmiga for the following reasons as stated in the reasoning for the obviousness rejection at the top of page 6 in the Office Action. This is because if a shrink tubing is used for the light integrator shown in Fig. 1A of Farmiga or for the light integrator shown in Fig. 4C of Farmiga instead of the clamping assembly 37 this will lead to a transverse sliding of the slabs 12 since the shrink tubing pushes the slabs 12 against each other. This transverse sliding is explained further below.

It is pointed out that the clamping assembly 37 shown in Fig. 4C which pushes the slabs 11 and 12 only in the upward and downward direction, but which does not push the slabs 12 in the transverse direction. Such a pushing in the transverse direction would lead to the described transverse sliding of the slabs 12 as already mentioned in column 5, lines 16 and 17 of Farmiga. However, it is a technical inherent feature of a shrink tubing that a shrink tubing exerts a force directed to the middle of the cross section of the shrink tubing along the entire circumference of the shrink tubing. Therefore, the use of the shrink tubing for fastening the light integrators of Farmiga always lead to the undesired effect that the slabs 12 are transversely moved. However, as a result of this movement, the precisely adjusted cross-sectional dimensions (column 7, lines 13 to 16 of Farmiga) before fastening by the shrink tubing would be changed.

Therefore, it is respectfully asserted that the combination of Farmiga and Takahashi does not teach or suggest to provide two parts of the light integrator such that one of the two parts is provided with a projection engaging in a cutout of the other part after assembly and to use a shrink tubing for holding together the parts such that the parts contact one another to be practically light-proof.

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VIII. The obviousness rejections of claims 16-17 and 21-22 in view of a combination of Farmiga and Levis, US 5,902,033.

Claims 16 and 21 depend from claim 14 which did not originally incorporate the limitations of claim 18 as it does now because 14= 14+15+18. Claim 18 was not rejected in view of Levis. Therefore, the amendment has traversed this rejection.

Applicants also respectfully note the following: Levis, (and also Laakmann US 5,005,944) do not respectfully teach or suggest using the shrink tubing for fastening the parts of the integrator and providing at least one of the parts with a projection engaging in a cutout of the other part after assembly so that a possible gap between the parts in which light could be lost is reduced.

Additionally, it would not respectfully be obvious for one skilled in the art to modify Farmiga with the beam shape construction of Levis as asserted by the USPTO. Where do the references respectfully teach that, inherently or impliedly? Also, applicants seasonably challenge all of the USPTO's assertions of what is well known in the art found at page 7 of the Office Action under MPEP 2144.03 and require that an affidavit of the Examiner be provided, or a reference be provided, to establish what is well known in the art as is required when seasonably challenged under MPEP 2144.03 citing the case law.

Levis  
is used.

IX. Requirements for a *prima facie* obviousness rejection

MPEP 706.02(j) (citing the 35 USC 103 and case law) is specific regarding the required elements of an obviousness rejection and applicants respectfully assert for the record and for purposes of appeal that the reasoning provided in the final rejection does not respectfully meet these specific requirements.

Due to the above, although the Examiner is respectfully believed to be well versed in the law of obviousness, and combination of references law, the relevant law is respectfully reproduced below for completeness of the record and to expedite prosecution.

In order to establish a *prima facie* case of obviousness under 35 USC 103 according to section 706.02(j) of the Manual of Patent Examining Procedure (MPEP) the following criteria must be met:

The 35 USC 103 Standard for Combining/Modifying References

The Manual of Patent Examining Procedure, section 706.02(j) sets forth the standard for combining and/or modifying prior art of 35 USC 103, and states:

To establish a *prima facie* case of obviousness, three basic criteria must be met. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a reasonable expectation of success. **Finally**, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria. [Bold emphasis provided.]

These requirements are not respectfully discussed at all in the rejection which at least respectfully provides insufficient reasoning for an obviousness rejection at paragraphs 8 & 9

of the Office Action, wherein at least no specific discussion of motivation to combine, and reasonable expectation of success is provided as is required.

X. The new claims 23-27

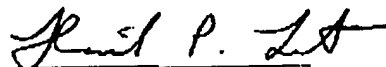
No new matter has been added. Support is also found in the figures. The light integrator according to claim 23 includes only two sorts of parts, namely, T-shaped and I-shaped, which can then be produced in a simple manner by mass production. In addition, due to the use of two T-shaped and two I-shaped parts a particularly good hold is always ensured, as mentioned on page 8, lines 7 to 10 of the English application text.

Therefore, also amended claims 14 and 23 should be allowable.

XI. Conclusion

In light of the *FESTO* case, no argument or amendment made herein was related to the statutory requirements of patentability unless expressly stated herein. No claim amendment or argument made was for the purpose of narrowing the scope of any claim unless Applicant has explicitly stated that the argument is "narrowing." It is respectfully requested that all of the claims be reconsidered and allowed. An early and favorable action on the merits is respectfully requested.

Respectfully submitted,



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**MARKED-UP SPECIFICATION**

At page 1, lines 3-10 please delete the current paragraphs and replace them with the following amended paragraphs:

--Background of the Invention

c) Field of the Invention

The invention is directed to a method for producing a light integrator and to a light integrator for homogenizing a light bundle entering an input surface and exiting from an output surface. The invention is further directed to a use of this method.

d) Description of the Invention

Light integrators are known. In principle, they comprise a body which is coated uniformly by reflecting material in which the light is introduced, the light is then repeatedly reflected back and forth at the reflecting surfaces. Because of the multiple reflection, the origin of the light for the light bundles exiting at the output is lost to a great extent. In this way, a homogenized illumination surface is achieved.--

At page 3 lines 10-12 please delete the current paragraph and replace it with the following amended paragraph:

--Object and Summary of the Invention

It is the summary object of the invention to provide an integrator which is optimized with respect to the amount of light that is transmitted, but which does not have the disadvantages of a totally reflecting rod.--

At page 6, lines 22-27 please delete the current paragraph and replace it with the following amended paragraph:

--Brief Description of the Drawings

Fig. 1 is a schematic view illustrating the manner of operation of a light integrator using the example of projection with a matrix, particularly a tilting mirror matrix;  
Fig. 2 shows a perspective view of an integrator according to the invention;  
Fig. 3 shows a front view of the integrator of Fig. 2;  
Fig. 4 shows another embodiment example for an integrator according to the invention.--

**MARKED-UP CLAIMS**

Please cancel claims 13, 15, and 18.

Please amend the claims as follows:

12. (Amended) A method for producing a light integrator, comprising the following steps for forming a cavity of the integrator having an inner reflective coating:

fabricating at least two parts from which the light integrator can be assembled and whose surfaces, provided as inner sides of the cavity, are uncovered [exposed];

providing [rimless] reflective coating [of] on at least the surfaces of the parts provided as inner sides of the cavity; [and]

assembling and fastening [of] the parts[.];

wherein the two parts are fabricated such that one of the two parts is provided with a projection for engaging in a cutout of the other part after assembly,

and wherein fastening is carried out by this following steps:

covering the assembled parts with shrink tubing, and;

shrinking the tubing until a suitable strength of the integrator is achieved for reducing a possible gap between said two parts in which light could be lost.

14. (Amended) A light integrator for homogenization of a light bundle entering an input surface and exiting from an output surface, comprising [that]:

said light integrator [has] having a cavity with an inner reflective coating for conducting light;

[and] said light integrator being composed of at least two parts whose surfaces, which are uncovered [exposed] prior to assembly and face inward after assembly, are provided with [a mirror layer.] said inner reflective coating;

wherein one part is provided with a projection engaging in a cut out of the other part after assembly; and

wherein the parts are held together by at least one piece of shrink tubing such that the parts contact one another to be practically light-proof.

16. (Amended) The light integrator according to claim 14 [15], wherein [the inner sides and outer sides] surfaces of the light integrator which form the cavity are planar, the light integrator [has] cavity having the shape of a geometric prism with the surfaces [rectangular] on the bottom and top of the cavity being rectangular shaped and the surfaces being provided as output [outlet] and input [inlet] surfaces respectively at opposite ends of the cavity and the projection and the cutout [are] being rectangular [, particularly] or square.

19. (Amended) The light integrator according to claim 15 [18], wherein shrink tubing is arranged in 5 the middle between the input surface and output surface for holding the parts together.

20. (Amended) The light integrator according to claim 16 [18], wherein it has two pieces of shrink tubing enclosing the light integrator for holding the parts together in the vicinity of their input surface and output surface.

Please add the following new claims:

23. (New) A light integrator for homogenization of a light bundle entering an input surface and exiting from an output surface comprising:

said light integrator having a cavity with an inner reflective coating for conducting light; and

said light integrator being composed of at least two parts whose surfaces, which are uncoated prior to assembly and face inward after assembly, are provided with said inner reflective coating;

wherein one part is provided with a projection engaging in a cutout of the other part after assembly, wherein the inner sides and outer sides of the light integrator form a cavity and are planar,

wherein the light integrator has the shape of a geometric prism with rectangular bottom and top surfaces provided as output and input surfaces, and the projection and cutout are rectangular or square in shape; and

wherein the parts comprise two T-shaped and two I-shaped side parts and wherein the parts are held together by at least one piece of shrink tubing such that the parts contact one another to be practically light-proof.

24. (New) The light integrator according to claim 23, wherein shrink tubing is arranged in the middle between the input surface and output surface for holding the parts together.

25. (New) The light integrator according to claim 23, wherein it has two pieces of shrink tubing enclosing the light integrator for holding the parts together in the vicinity of their input surface and output surface.

26. (New) A method of using the light integrator according to claim 23, including the step of homogenizing the light originating from a light source which is provided for the illumination of an electronically controllable matrix for showing image elements.

27. (New) The method according to claim 26, wherein the matrix is a tilting mirror matrix.